

Mar 2015

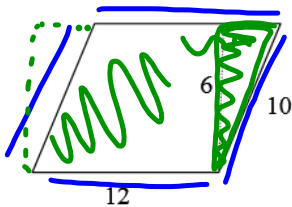
Name _____

Unit 1 Test - Trig and Geo

Expectation	Level Achieved
T61 - solve problems involving measurement and geometry and arising from real-world applications	
T63 - solve problems using primary trigonometric ratios of acute and obtuse angles, the sine law, and the cosine law, including problems arising from real-world applications, and describe applications of trigonometry in various occupations	

Expectation T61

- 1.) Determine both of the perimeter and area of the following figures accurate to one decimal place.



$$P = 12 + 10 + 12 + 10$$

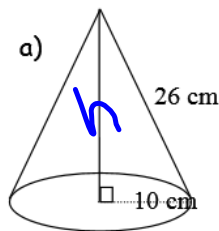
$$= 44$$

$$A = bh$$

$$= b(12)$$

$$= 72$$

2. Find the volume and surface area of each solid accurate to two decimal places.



a)

$$V = \frac{1}{3}\pi r^2 h$$

$$SA = \pi r^2 + \pi r s$$

$$h^2 = 26^2 - 10^2$$

$$= 676 - 100$$

$$= 576$$

$$h = \sqrt{576}$$

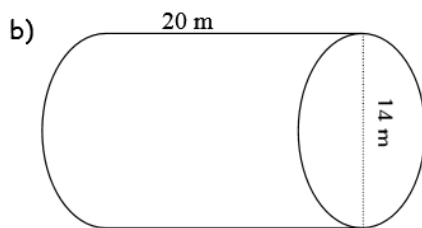
$$= 24$$

$$V = \frac{1}{3}\pi (10)^2 (24)$$

$$= 2512.27 \text{ cm}^3$$

$$= \pi (10)^2 + \pi (10)(26)$$

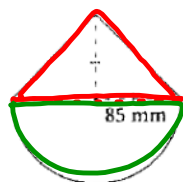
$$= 1130.97 \text{ cm}^2$$



$$\begin{aligned}
 r &= 7\text{ m} \\
 h &= 20\text{ m} \\
 V &= \pi r^2 h \\
 &= \pi (7)^2 (20) \\
 &= 3077
 \end{aligned}$$

$$\begin{aligned}
 SA &= 2\pi r^2 + 2\pi rh \\
 &= 2\pi (7)^2 + 2\pi (7)(20) \\
 &= 1186
 \end{aligned}$$

3. Determine the area of the following figure in mm and cm.



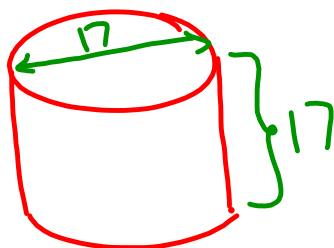
$$\begin{aligned}
 A_{\text{circle}} &= \frac{\pi r^2}{2} \\
 &= \frac{\pi (85)^2}{2} \\
 &= 11349
 \end{aligned}$$

$$\begin{aligned}
 A_{\Delta} &= \frac{bh}{2} \\
 &= \frac{(170)(85)}{2} \\
 &= 7225
 \end{aligned}$$

$$\begin{aligned}
 \text{Total Area: } &18574 \text{ mm}^2 \\
 &= 185.74 \text{ cm}^2
 \end{aligned}$$

4. A cylindrical coffee cup has a height of 17cm. Determine the maximum volume in litres that a coffee cup with this height can have in order to minimize the surface area.

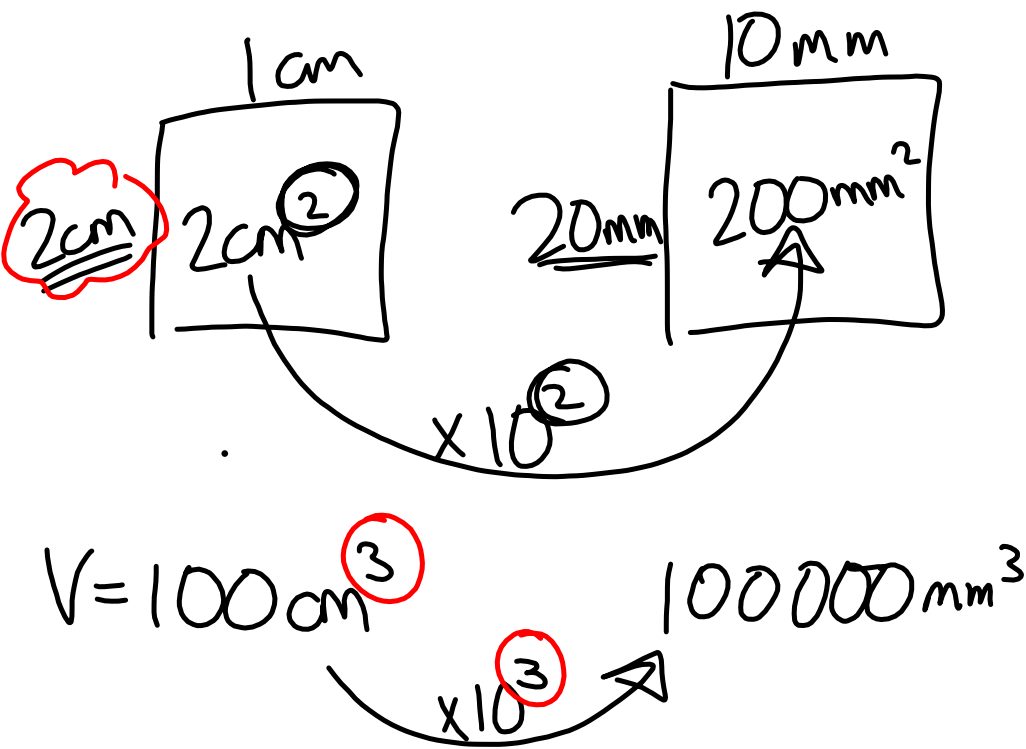
$$h = d = 17\text{ cm}$$



$$\begin{aligned}
 V &= \pi r^2 h \\
 &= \pi (8.5)^2 (17) \\
 &= 3858 \text{ cm}^3
 \end{aligned}$$

$$1 \text{ cm}^3 = 1 \text{ mL}$$

$$\begin{aligned}
 3858 \text{ mL} &= 3.8 \text{ L}
 \end{aligned}$$



5. A room is 4 m long by 3.6 m wide by 2.5 m high. A 1-gallon can of paint covers approx. 36 m^2 .

a) How many cans of paint will be needed to paint two coats on all surfaces except for the floor (you need to include the ceiling)? Show all your work, round to the nearest hundredths.

4 walls: ceiling

$$2.5 \times 4 \times 2 = 20 \quad 4 \times 3.6 = 14.4$$

$$2.5 \times 3.6 \times 2 = 18$$

of cans:

$$\frac{104.8}{36} = 2.9$$

$$1 \text{ coat: } 20 + 14.4 + 18 = 52.4$$

$$2 \text{ coats: } 2 \times 52.4 = 104.8 \text{ m}^2$$

$\therefore 3 \text{ cans!}$

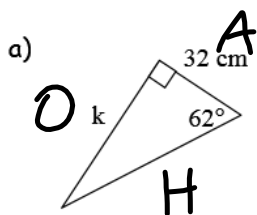
b) What is the cost to paint the room if each can costs \$28.99?

$$3 \times 28.99 = 86.97$$

Calculate tax:

Expectation T63

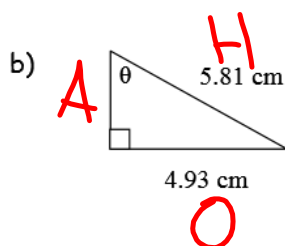
Use your knowledge of SOH CAH TOA to find the value of the given variable to 1 decimal place.



$$\tan 62^\circ = \frac{k}{32}$$

$$32 \times \tan 62^\circ = k$$

$$60.2 = k$$

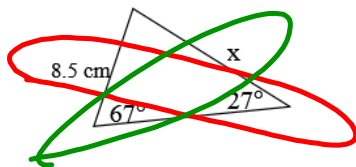


$$\sin \theta = \frac{4.93}{5.81}$$

$$\theta = \sin^{-1} \left(\frac{4.93}{5.81} \right)$$

$$\theta = 58^\circ$$

7. Find the value of x , correct to 1 decimal place.

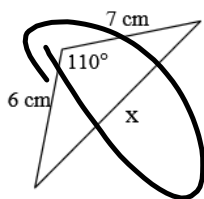


$$\frac{x}{\sin 67^\circ} = \frac{8.5}{\sin 27^\circ}$$

$$x = \frac{8.5 \sin 67^\circ}{\sin 27^\circ}$$

$$x = 17.2 \text{ cm}$$

8. Find the value of x , correct to 1 decimal place.



$$x^2 = 6^2 + 7^2 - 2(6)(7)\cos 110^\circ$$

$$x = 10.7 \text{ cm}$$

9. If angle Y is between 0° and 180° , and $\sin Y = 0.2847$:

a) How many possible solutions are there for angle Y between 0° and 180° ?

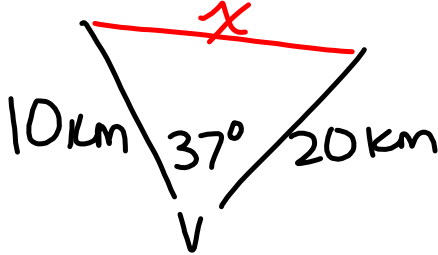
b) Find the possible measure(s) of angle Y

$$Y_1 = \sin^{-1}(0.2847) \\ = 17^\circ$$

$$Y_2 = 180 - 17$$

$$Y_2 = 163^\circ$$

10. Two roads separate from a village at an angle of 37° . Two cyclists leave the village at the same time. One travels 5.0 km/h on one road and the other travels 10.0 km/h on the other road. How far apart are the cyclists after 2 hours?



COSINE LAW!

$$x^2 = 10^2 + 20^2 - 2(10)(20)\cos 37^\circ$$

$$x = 13.4 \text{ km}$$